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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,876	12/29/2000	Hideo Itoh	201419US0X	6748

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EXAMINER

CHEVALIER, ALICIA ANN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 06/18/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,876

Applicant(s)

ITOH ET AL.

Examiner

Alicia Chevalier

Art Unit

1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 50-95 is/are pending in the application.
- 4a) Of the above claim(s) 57,59,60,63,64,72,74,75 and 78-94 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 50-56,58,61,62,65-71,73,76,77 and 95 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

RESPONSE TO AMENDMENT

NEW REJECTIONS

1. **The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.**

Election/Restrictions

2. Due to Applicant's cancellation of the original claims and the newly submitted claims having a more comprehensive/limiting independent claim, the species of circular, elliptical or polygonal for the group of the openings has been found allowable. As such the species restriction regarding the openings and only the openings has been withdrawn. Therefore, claims 50-95 are pending in the current application and claims 57, 59, 60, 63, 64, 72, 74, 75 and 78-94 stand withdrawn due to the previous restriction requirement and election of papers #3 and #5.

Claim Rejections - 35 USC § 112

3. Claims 50-56, 58, 61, 62, 65-71, 73, 76, 77 and 95 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 50 recites "wherein the plurality of thin-film photocatalytic layer and the plurality of thin-film support layers alternate with each other and contact sequentially at surface areas each smaller than the area of the contacted thin-film photocatalytic layer." It is unclear from the claim language what "each smaller" is referring back to, i.e. only the thin-film support layers or

Art Unit: 1772

both the thin-film photocatalytic layers and the thin-film support layers. From the drawings and specification it is believed that the support layers have smaller surface areas than the sequentially contacting photocatalytic layers. The Examiner suggest language similar to “wherein the plurality of thin-film photocatalytic layer and the plurality of thin-film support layers alternate with each other and contact sequentially at surface areas, wherein each thin-film support layers has a smaller surface area than the surface area of the contacting thin-film photocatalytic layers.”

The phrase “lowermost” in claims 61 and 62 is unclear which renders that claims vague and indefinite. It is unclear if the lowermost photocatalytic layer is the one nearest or furthest from the substrate. For purposes of examination it is considered to be the one closest to the substrate is considered the lowermost as illustrated in figure 4(a) of the instant application.

Claim Rejections - 35 USC § 103

4. Claims 50, 51, 53, 54, 56, 61, 62 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (5,407,738).

Tabata discloses a minute structure (photocatalytic member) for showing colors by reflection and interference of natural light. The minute structure comprises base portion (substrate), a plurality of fin portions (thin-film photocatalytic layers) aligned in a first direction and positioned such that the adjacent fin portions are spaced from each other so as to define there between a void space which is filled with air, each fin portion having a first width defined in a second direction which is perpendicular to the first direction and a second width defined in the first direction, the void space having a third width which is defined in the first direction, and a central portion (thin film support layers) for uniting said fin portions (summary of the invention

Art Unit: 1772

and figures 3 and 4). From figures 3 and 4 it can be seen that the minute structure further comprises parallel groove shaped openings on a surface, at uniform intervals, of the member and through a fin portion and wherein a space communicates with the opening in order to be open to the outside of the structure by way of the opening. The structure can be made from transparent and colorless organic material (insulators) such as polyester, polyacrylonitrile, polystyrene or the like (col. 4, lines 22-37). From figures 3 and 4 it can be seen that the fin portions have surfaces becoming larger towards the lowermost fin portion.

Although, Tabata does not specifically disclose that the central portion and the fin portions are separate layers it can be seen from figure 4(a) of the instant application and figure 4 in Tabata that these are equivalent structures.

Tabata further discloses that the thickness of the fin portions effects reflectance and shows in figures 16-21 the reflectance of different wavelength at different fin thickness (col. 4, lines 38-54).

The exact thickness of the fin portions (thin-film photocatalytic layers) is deemed to be a cause effective variable with regard to the reflectance of the structure. It would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as thickness of the fin portions (thin-film photocatalytic layers) through routine experimentation in the absence of a showing of criticality in the claimed combined thickness. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). One of ordinary skill in the art would have been motivated to optimize the thickness of the fin portions in order to optimize the reflectance of a desired wavelength.

Art Unit: 1772

5. Claims 52, 65-96, 71, 76 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (5,407,738) in view of Kumazawa et al. (6,248,436).

Tabata discloses all the limitations of the instant invention except for the plurality of thin-film photocatalytic layers are made of titanium oxide.

Kumazawa discloses a color exhibition structure for exhibiting color produced by reflection, interference and/or scattering of a light incident thereon (col. 1, lines 8-10). The structure comprising a number of minute granular substances dispersed in a transparent substance (col. 2, lines 35-51). The transparent substance is material such as polyester, polyacrylonitrile, polystyrene or the like (col. 4, lines 1-16). The granular substance may comprise anatase type titanium dioxide (col. 4, lines 17-40).

It is requires for effective color production that the refractive index of the granular substances is greater than the refractive index of the transparent substance. In general, human's color recognition is possible with 0.4 or more scattering efficiency. The scattering efficiency increases as the refractive index difference increases and produces vivid colors. See column 2, line 65 to column 3 line 19.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the anatase type titanium dioxide granular substance as taught by Kumazawa to the transparent material of Tabata because it would increase the scattering efficiency to produce vivid colors.

Allowable Subject Matter

6. Claims 55, 58, 70 and 73 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

ANSWERS TO APPLICANT'S ARGUMENTS

7. Applicant's arguments filed in paper #9 regarding the previous rejections of record in paper #6 have been considered but are moot since the rejections have not been repeated for the new claims and in view of the new rejections.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kumazawa et al. (5,472,298), Kumazawa et al. (5,849,383), Kumazawa et al. (6,051,513), Shimizu et al. (6,306,529), Asano et al. (6,326,094), Owaki et al. (6,335,094) and Kumazawa et al. (6,490,090) all disclose similar photocatalytic members.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit: 1772

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

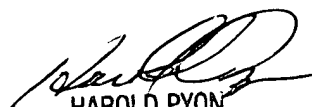
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia Chevalier whose telephone number is (703) 305-1139. The Examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:00 p.m. The Examiner can also be reached on alternate Fridays

If attempts to reach the Examiner are unsuccessful, the Examiner's supervisor, Harold Pyon can be reached by dialing (703) 308-4251. The fax phone number for the organization official non-final papers is (703) 872-9310. The fax number for after final papers is (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose phone number is (703) 308-0661.

ac

6/7/03



HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

6/9/03